

CLINICAL PROFILE OF SNAKE BITE IN CHILDREN IN GOVT RAJAJI HOSPITAL

A STUDY OF 145 CASES

**DISSERTATION SUBMITTED FOR THE DEGREE OF
DOCTOR OF MEDICINE
BRANCH – VII (PAEDIATRICS)**

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**THE TAMILNADU
DR. M.G.R. MEDICAL UNIVERSITY
CHENNAI, TAMILNADU**

BONAFIDE CERTIFICATE

This is to certify that this dissertation entitled “**CLINICAL PROFILE OF SNAKE BITE IN CHILDREN IN GOVT RAJAJI HOSPITAL**” is bonafide record work done by **Dr. P.UVARAJ** under my direct supervision and guidance, submitted to the Tamil Nadu Dr. M.G.R. Medical University in partial fulfillment of University regulation for MD, Branch VII-Paediatrics.

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DECLARATION

I **Dr. P.UVARAJ** solemnly declare that this dissertation titled **“CLINICAL PROFILE OF SNAKE BITE IN CHILDREN IN GRH”** has been done by me from November 2006 to June 2008. I also declare that this bonafide work or a part of this work was not submitted by me or any other for any award, degree, diploma to any other University board either in India or abroad.

This is submitted to The Tamilnadu Dr. M. G. R. Medical University, Chennai in partial fulfillment of the rules and regulation for the award of Doctor of Medicine degree Branch –VII (Paediatrics) to be held in March 2009.

Place: Madurai

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INTRODUCTION

Snake-bite is an important and serious emergency medical problem in many parts of the world, especially in South Asian countries. There are more than 3500 species of snakes worldwide of which only 300 are poisonous. There are about 330 species of snakes found in India of which 70 are poisonous. It has been estimated that annually India records about 10000-15000 deaths due to snake bite. Case fatality rate is 2-10%. The most common Indian venomous snakes referred to as “Big Four” are the krait, common cobra, saw-scaled viper & russell’s viper.

Most snake bites are accidental and inflicted on lower limbs of high risk population such as children while playing or working in field. Seasonal peaks in incidence are associated with onset of rainy season, flooding & rice harvesting season and occasionally during construction of new building.

CLASSIFICATION

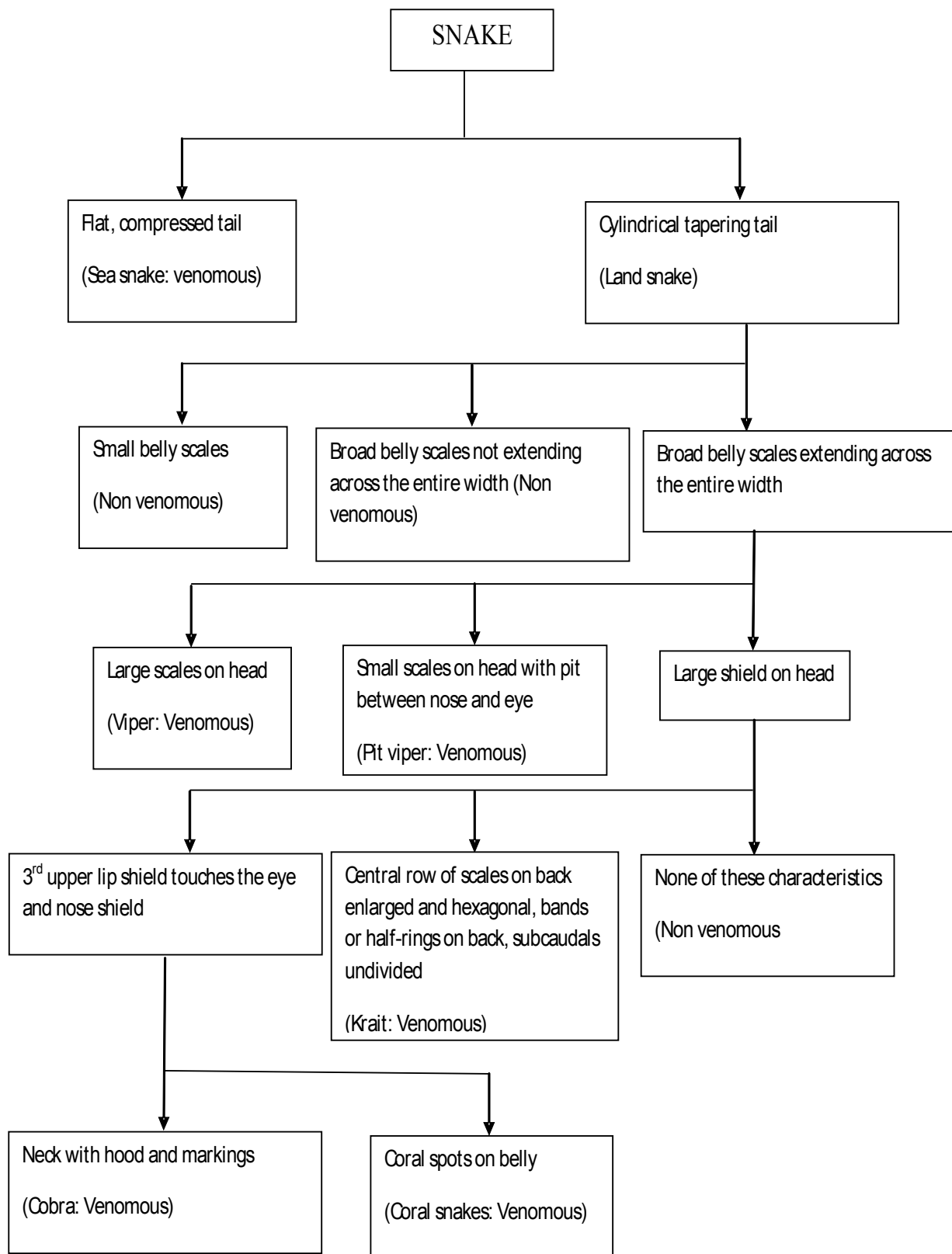
There are two important groups of venomous snakes in South East Asia

Elapidae – cobra, mamba, krait, coral snakes, garter snakes, sea snakes.

Viperidae – saw scaled viper, russell's viper, rattle snakes.

IDENTIFICATION OF SNAKES

There is no simple rule for identifying a dangerous venomous snake. Some harmless snakes have evolved to look almost identical to venomous ones. However, some of the most notorious venomous snakes can be recognized by their size, shape, colour, pattern of markings, their behaviour and the sound they make when they feel threatened. For example, the defensive behaviour of the cobras is well known, they rear up, spread a hood, hiss and make repeated strikes towards the aggressor. Colouring can vary a lot. However, some patterns, like the large white, dark rimmed spots of the Russell's viper, or the alternating black and yellow bands of the banded krait are distinctive. The blowing hiss of the Russell's viper and the grating rasp of the saw-scaled viper are warning and identifying sounds.



FANG MARKS

As previously believed, bite marks are not useful indicators of poisoning. This is because many venomous species possess more than one set of fangs and non venomous species can leave two puncture marks from enlarged teeth, which can appear to be fang like.

PATHOPHYSIOLOGY

Snake venom has 20 or more components of which more than 90 percent of dry weight is protein. It is in the form of enzymes, non-enzymatic polypeptide toxins and non toxic proteins. The remaining 10 percent are non protein ingredients such as carbohydrates and metals often in the form of glycoproteins.

Enzymes:

Venom procoagulants

RVV-x, a glycoprotein produced by russell's viper activates factor X by calcium dependent mechanism and also acts on factor IX and protein C.

arginine ester hydrolase activates factor V.

Eccarin activates prothrombin.

Serine proteases cleaves fibrinopeptide-A from fibrinogen molecules.

Phospholipases-A2 – It is the most widespread of the venomous enzymes. It damages mitochondria, red blood cells, leucocytes, platelets, skeletal muscles, vascular endothelium and other membranes leading to myotoxicity, neurotoxicity, cardiotoxicity, hemolysis and increased vascular permeability.

Hyaluronidase – It promotes the spread of venom through tissues.

Hydrolases – It is responsible for the local changes in vascular permeability leading to edema, blistering, bruising and necrosis.

Nonenzymatic polypeptide toxins:

These are found in elapid venoms (cobra, krait). It consists of postsynaptic and presynaptic toxins. The postsynaptic neurotoxins are α bungarotoxin and cobrotoxin which binds to the acetylcholine receptors at the motor end plate. The presynaptic neurotoxins are β bungarotoxin, crotoxin, etc which block the release of acetylcholine at neuromuscular junctions.

Average yield per bite in terms of dry weight of lyophilized venom is 60 mg for cobra, 63 mg for russell's viper, 20 mg for krait and 13 mg for saw scaled viper. Respective fatal doses are 12, 15, 6&8 mg.

PATHOLOGICAL PROCESS	EFFECT
Direct cytolytic action	Local necrosis and secondary infection
Procoagulants leading to intravascular coagulation & DIC	Bleeding
Platelet function defects	Bleeding
Postsynaptic and presynaptic blockade	Neurotoxicity
RBC membrane destruction	Intravascular hemolysis
Direct damage to tubules of kidney, renal ischaemia & hemolysis	Acute renal failure
Increased capillary permeability	Edema, pulmonary edema, serous effusions
Decreased intravascular volume	Shock
Cardiotoxicity	Hypertension. ECH changes, acute myocardial infarction

FACTORS DETERMINING THE SEVERITY

1. AGE – younger the age more severe the manifestations.
2. LOCATION – bites over face, neck, trunk and superficial vessels are fatal.
3. POST SNAKE BITE ACTIVITY – exertion or running after the bite increases the venom absorption.

CLINICAL FEATURES

NON SPECIFIC MANIFESTATIONS

The non specific symptoms that are due to snake bite are vomiting, headache, myalgia, vertigo, tingling and numbness over tongue, mouth & scalp and hypersalivation. These symptoms are not related to the venom per se. They are often due to fear and anxiety. The duration from time of bite to time of onset of poisoning may be as early as 5 minutes in cobra or as late as 10 hours in krait bites. In viper the mean duration of poisoning is 20 minutes and for seasnakes it is usually within 2 hours.

SPECIFIC MANIFESTATIONS

ELAPIDAE (COBRAS, KRAIT)

The local effects due to envenomation by elapids are tender swelling with regional lymphadenopathy and blistering within 24 hrs. There may be superficial necrosis which may be extensive. If there is secondary infection it may lead on to gangrene and the patients may loose their digits, which causes increased morbidity. The local effects are minimal in krait.

The venoms of the elapids are best known for their neurotoxic effects. The paralysis is usually first detected as ptosis followed by external ophthalmoplegia. Other muscles involved later are face, palate, jaw, tongue, vocal cord, neck muscles and muscles of deglutition. Respiratory failure in early stages may be due to obstruction of

airway by paralyzed tongue or vomiting. In later stages it is due to paralysis of intercostal muscle or diaphragm. Loss of consciousness and convulsions are due to hypoxemia secondary to respiratory paralysis. Neurotoxic effects are completely reversible either acutely in response to antivenom or anticholinesterase effect or may wane spontaneously in 1 to 7 days.

VIPERIDAE (RUSSELL'S VIPER, SAW SCALED VIPER)

The local reactions are severe in viper bites. The swelling due to envenomation spreads very rapidly. There is usually associated pain, tenderness and lymph node enlargement. Bruising may be seen especially along the path of the lymphatics. Blisters may be seen which are filled with clear or blood stained fluid. There may be necrosis of the skin, subcutaneous tissue and muscle which may lead to compartment syndrome. Absence of pulse, sudden severe pain and a demarcated cold limb suggests thrombosis of a major artery.

The hemostatic abnormalities that are characteristic of viper bites are persistent bleeding from fang puncture wounds, venepuncture or injection sites and these may be the first clinical sign of bleeding diathesis. There could be gingival hemorrhages, epistaxis, hematemesis, ecchymosis, hemoptysis, hematuria, subconjunctival and intracranial hemorrhages. Hypotension and shock are common due to the extravasation of fluid into the swollen limb. Hemoglobinuria may be present, suggestive of intravascular hemolysis. Activation of coagulation cascade may lead on to disseminated

intravascular coagulation which may further exacerbate the bleeding. Due to increased vascular permeability there may be serous effusions and pulmonary edema. Renal failure is the major cause of death in viper bites. It may be due to the direct toxic effect of the toxin or due to renal ischaemia and intravascular hemolysis.

INVESTIGATIONS

Investigations are used for monitoring the patient and determining the type of envenomation.

- Complete blood count – anemia, thrombocytopenia
- Peripheral smear – evidence of hemolysis and DIC
- Coagulation profile – increased bleeding time, clotting time and prothrombin time
 - 20 minutes whole blood clotting time – It was adopted as the standard test for coagulopathy. It is simple to carry out but crucially requires a clean, new and dry test tube. A few mL of fresh venous blood is left undisturbed for 20 minutes, and then gently tilted. If the blood is still liquid this is evidence of coagulopathy and confirms that the bite is by Viper species. Cobras or Kraits

do not cause anti-haemostatic symptoms.

- Renal function tests
- Serum Electrolytes – hyperkalemia may be present
- Urinalysis – RBC's, RBC cast or hemoglobin may be seen
- ECG – changes are usually nonspecific and include bradycardia, AV block with ST segment elevation or depression and features suggestive of hyperkalemia.

TREATMENT

First aid

As 70 percent of all snakebites are from non venomous species and only 50% of bites by venomous species actually envenomate the patient, reassure the patient to prevent exertion and anxiety. As movement increases the venom absorption immobilize the limbs in the same way as a fractured limb. Children can be carried. Use bandages or cloth to hold the splints, not to block the blood supply or apply pressure. Do not apply any compression in the form of tight ligatures. Tourniquets and pressure immobilization methods are not used in India. Incision, suction, electric shock, cryotherapy and washing are contraindicated.

Criteria for Antisnake venom administration

- Severe local symptoms – swelling rapidly crossing a joint or involving half of the bitten limb in the absence of tourniquet.

- Increased 20 minutes whole blood clotting time or spontaneous bleeding.
- Neurological impairment such as ptosis.

Dose of ASV

The initial ASV dose is a subject of debate. As russell's viper on an average injects about 63 mg of venom in the first bite to both adults and children, logic is to administer ASV to neutralize this amount of venom. One vial of ASV neutralizes 6 mg of russell's viper venom. So a total of 8-10 vials may be required for the initial dose³. The range of venom injected is 5 – 147 mg. so a maximum of 25 vials may be required. There is no evidence to suggest children should receive either more ASV because of body mass or less in order to avoid adverse reactions. The total dose of ASV is to be administered over 1 hour.

Adverse effects

Adverse effects to antisnake venom may be due to anaphylaxis or pyrogenic reactions. If handled early with the primary drug of choice, these reactions are easily surmountable. Early intervention against these kind of reactions has been shown to have more positive outcomes. The reactions are urticaria, itching, fever, chills, nausea, vomiting, diarrhea, abdominal cramps, tachycardia, hypotension, bronchospasm and angioedema. On the appearance of any one of the reactions ASV should be discontinued. Adrenaline 0.01 mg/kg (1 in 1000 solution) is the drug of choice. It should be given intramuscularly as absorption is fast (usually within 8 minutes). Adrenaline can be repeated every 10 minutes to a maximum of three doses. For longer protection

Hydrocortisone 2 mg/kg and antihistaminics (pheniramine maleate 0.2 mg/kg) should be administered. After the reactions have subsided ASV should be restarted slowly. ASV test dose is abandoned since they have no predictable value in anaphylactoid or late serum reactions and they also pre-sensitize the patient to proteins^{2,3}.

Repeat doses of ASV

If the 20 minutes Whole Blood Clotting Time after 6 hrs is prolonged or the cellulitis is increasing then ASV should be repeated. In case of neurotoxic bites once the initial 10 vials and neostigmine 0.05 mg/kg has been given monitor the patient. If condition does not improve or it worsens within 1-2 hrs then a second and final dose should be given. If there is no improvement after second dose, the further ASV is of no use and the patient is managed with ventilator.

Supportive management

Fluid management and ionotropes

Avoid IM injections

Analgesics and sedatives

Broad spectrum antibiotics with anaerobic cover

Blood component transfusion

Local wound management

Dialysis if acute renal failure is present

Fasciotomy if compartment syndrome is present

REVIEW OF LITERATURE

- 1) Adhisivam et al⁶ did a retrospective study in the Department of Pediatrics, Jawaharlal Institute of Post Graduate Medical Education and Research (JIPMER), a tertiary care hospital at Pondicherry to study the clinical profile of snake bite envenomation. During the study period of 34 months (Nov 2002 to Aug 2005), 50 children (9 months to 12 years of age) were admitted for snake bite envenomation. 42 % of the bites were hemotoxic and 8 % were neurotoxic. Number of deaths due to the snake bite was 9 (18%) and all were due to hemotoxic bites. Complications like Disseminated intravascular coagulation (10%) and acute renal failure (18%) were present. 4 of them required ventilator support (all were neurotoxic bites). Local cellulitis was present in 66 % of the patients. Average Antisnake venom required was 100 ml (10 vials). Anaphylaxis to Antisnake venom was seen in 12 % of cases. Average PICU stay was 2 days. There is an urgent need to educate the rural population about the hazards and proper first aid for snakebites. Ready availability and appropriate use of antisnake venom, close monitoring of patients, and timely institution of ventilatory support help in reducing the mortality. Randomised controlled trials are needed to investigate regarding rationale use of antivenom treatment.
- 2) Sharma N et al⁷ did a study on clinical profile of snake bite in postgraduate institute of medical science and research. It was a retrospective study of all snake

bite cases admitted from January 1997 to December 2001. Of a total of 142 cases of snakebite there were 86 elapid bites presenting with neuromuscular symptoms and 52 viper bites having haemostatic abnormalities. Urban to rural ratio was 1:4.7 and male to female ratio was 4.25:1. Median time to arrival at our hospital after the bite was nine hours and mean duration of hospital stay was eight days. Twenty seven cases had acute renal failure and 75% of all elapid bites required assisted ventilation. Seventeen of 119 patients who received antivenom had an adverse event. The average dose of antivenom was 51.2 vials for elapid bites and 31 vials for viper bites. Overall mortality rate was 3.5%. Snakebites are common in the rural population of developing countries. There is a need to educate the public about the hazards of snakebite, early hospital referral, and treatment.

- 3) Suchithra N et al⁸ has done a study to determine the clinical characteristics, factors involved in complications and the outcome in relation to timing of polyvalent snake antivenom administration in patients with snakebite envenomation. It was a retrospective study and all snake bite cases admitted to the emergency care unit of Kottayam Medical College between May 2005 and December 2006 were taken. 200 (34%) of 586 cases with snakebites had envenomation. The species of snake was identified in 34.5% of the venomous bites. 93.5% had signs of local envenoming. Regional lymphadenitis occurred in 61%. The mortality rate was 3%. Capillary leak syndrome, respiratory paralysis

and intracerebral bleeding were the risk factors for mortality. Those who received Snake antivenom early (bite to needle time <6 h) had more severe local envenomation than those who received Snake antivenom late (bite to needle time ≥6 h), but the latter group were more likely to suffer complications. 39.5% had complications, with acute renal failure being the most common (25.5%). Those who received Snake antivenom late had a higher risk of developing acute renal failure. Higher rates of complications were seen in those with severe coagulopathy, leucocytosis and those who received Snake antivenom late. Early administration of Snake antivenom reduces the risk of complications. The presence of leucocytosis and severe coagulopathy can predict adverse outcomes.

- 4) Bawaskar et al⁹ did a retrospective study in Bawaskar Hospital and Research Centre, Mahad Raigad, Maharashtra to determine the profile of snakebite envenomation in Western Maharashtra. Ninety-one cases of snakebite were admitted between January 1998 and January 2001 to the general hospital at Mahad. Forty-five (49.5%) patients had snakebite without envenomation. Twenty-six (28.6%) patients were paralyzed. Twenty-nine (31.9%) patients brought the snakes responsible for the bites (20 kraits, 9 *Echis carinatus*). 27 patients had local fang marks without local and systemic manifestations. Ten (11.0%) patients died, 3 on the way to hospital and 7 during treatment. Out of 7 cases transferred for tertiary care, 6 recovered and 1 died on the way to Mumbai. Early administration of anti-snake venom (ASV), endotracheal intubation and timely intervention with

mechanical ventilation and anticholinesterase treatment for Elapidae (krait and cobra) envenomation are crucial for saving lives.

- 5) Punde DP¹⁰ did a study in Punde hospital Mukhed, Nanded, Marathwada, Maharashtra to determine the pattern of snake-bites and their management in a rural area of India over a 10 year period. A total of 633 patients with snake-bite admitted to the Rural Community Centre and Punde Hospital between 1992 and 2001 were analysed retrospectively. The local and systemic manifestations of snake-bite, response to antsnake venom, atropine and neostigmine, the treatment of complications and the outcome were analysed. Of the 633 patients, 427 (67.5%) had been bitten by poisonous snakes. The majority of snake-bites (68.9%) occurred between May and November. Of the 427 envenomed by poisonous snakes, 274 (64.2%) were by *Echis carinatus* (saw-scaled viper), 71 (16.6%) by cobra, 42 (9.8%) by krait and 40 (9.4%) by Russell viper. The requirement of antsnake venom for treating neurotoxic envenomation was 40-320 ml and for *Echis carinatus* and Russell viper bites it was 20-250 ml. The mortality rate was 4.7%. Ready availability and appropriate use of antsnake venom, close monitoring of patients, institution of ventilatory support and early referral to a larger hospital when required help in reducing the mortality. Most patients with snake-bites can be successfully managed even in small rural hospitals with limited

facilities.

- 6) Bhardwaj A et al¹¹ did a study in Central Research Institute, Himachal Pradesh to determine the risk factors exposing the population to snake bite and the common types of snakes causing them. It was a retrospective study. They studied 243 patients of snake bite over a period of 24 months. Seasonal variation in snake bite was seen, with a peak in the months of August and September. No bites were recorded in December, January and February. Eighty-four per cent of the bites were on the hands and feet (up to the ankle). Snake bites while sleeping were at uncommon sites. Non-poisonous snakes were the most common (90.5%). Kraits caused 60% of bites with envenomation. Snake bites occur frequently in the hills of Himachal Pradesh. Although snake bites are a cause for concern, most of them are caused by non-poisonous snakes.

- 7) Ganneru Brunda et al¹² did a study to find out the Epidemiological profile of snake-bite cases from Andhra Pradesh using immunoanalytical approach in Department of Biochemistry, University College of Science, Osmania University, Hyderabad. They reported a retrospective epidemiological data of snake-bite incidence in Andhra Pradesh and prospective assessment of the snake venom

antigens in forensic specimens collected from snake-bite victims through immunoanalytical approach. Data from 1379 snake-bite cases were collected from case reports for a 5 yr period (1999-2003) that included age and sex of the victim, district, month and time of incident, death of a victim and the time point of analysis. On the basis of the forensic data, specimens were collected from forensic medicine department and were analysed for the venom antigens (cobra and krait) by ELISA method. The peak number of snake-bite cases was seen during June-September. Higher incidence of snake-bite was recorded in males (76%). Of the 22 cases analysed by ELISA, 6 was tested positive for cobra venom, 8 cases tested positive for krait venom, the remaining specimens tested negative for both cobra and krait venom. The conclusion was evaluation of forensic specimens (autopsy and biopsy) of human snakebite victims based on specific molecular epidemiological tool like ELISA gives a true estimate of the incidence supplementing clinical and circumstantial evidence.

- 8) Bawaskar et al¹³ did a study in Bawaskar Hospital and Research Centre, Mahad Raigad, Maharashtra to determine the envenomation by the common krait (*Bungarus caeruleus*) and Asian cobra (*Naja naja*), their clinical manifestations and management in a rural setting. They have collected 30 subjects of presumed snake envenoming (krait = 23 cases, cobra = 7 cases). Details of the bite site, the

subject's activities at the time of the bite, local manifestations, systemic involvement, progress of venom poisoning, and subsequent response to treatment were collected on a standard data form. The type of snake was confirmed either by analysing the killed specimen or by combining clinical findings and identification by the subject or bystanders. Of 23 subjects bitten by kraits, 2 were deceased upon arrival, 7 died in the hospital, and 14 recovered. Of the 14 survivors, 4 required artificial respirations with a resuscitation bag, antivenom, and anticholinesterase drugs. The remaining 9 recovered with supportive treatment only. Of 7 subjects encountering cobras, 2 who had been bitten were deceased upon arrival at the hospital, and 1 died suddenly of an apparent cardiac arrest after seeing a hooded cobra on a road. Four subjects recovered with antivenom, anticholinesterase drugs, and/or artificial respiration. Early administration of antivenom prevents respiratory paralysis after elapid snake bite. Patients with evidence of respiratory insufficiency after neurotoxic venom poisoning require rapid intubation and artificial ventilation.

- 9) Lal P et al¹⁴ did a retrospective study to find out the socio-demographic profile of snakebite cases admitted in JIPMER Hospital from 1990-1996. 865 cases were admitted during the period. Proportional case rate of snakebite cases increased from 2.9/1000 admissions in 1990 to 5.2/1000 admissions in 1996. About 68

percent of the cases were males. About 40 percent of cases were observed from the period of September to November which coincided with maximum rainfall. About 85 percent of cases either got relieved or cured and 13.5 percent experienced mortality.

K Narvencar¹⁵ did a study in Department of Medicine, Goa Medical College, Bambolim, Goa to find out the relationship between the time of anti-snake venom (ASV) administration due to late arrival of patient at hospital and subsequent development of complications. All patients of snake bite that presented to the institution over a period of 1½ years were included in the present study. The patients were administered ASV within 10 minutes of presentation. The bite to needle time (time between the bite and start of ASV) was noted. The patients were then followed up to note any subsequent development of complications. The end-point of the study was normalization of haematological and neurological parameters. Fifty patients became eligible for the study. Twenty patients (40%) had complications while remaining 30 patients (60%) were uncomplicated. An attempt was made to study relationship between bite to needle time and subsequent development of complications. It was found to be significant at 5% level of significance. Incidence of complications was directly proportional to the duration of venom in the blood prior to neutralization by ASV due to late arrival of patient at hospital. The early institution of ASV is beneficial in preventing complications however severe is the systemic envenomation.

AIM OF THE STUDY

- To study the clinical profile and outcome of snake envenomation in children upto 12 yrs of age in Government Rajaji Hospital, Madurai.

MATERIALS AND METHODS

Study centre:

The study was conducted in the Institute of Child Health and Research Centre, Government Rajaji Hospital, Madurai.

Study period:

The study period is from November 2006 to June 2008.

Study design:

Prospective study.

Inclusion criteria:

- All children <12 yrs with history of snake bite
- Any child <12 yrs with history of unknown bite with any one of the following were taken into the study
 - Cellulitis involving more than 1/3rd of limb or crossing a joint

- Prolonged whole blood clotting time of more than 20 minutes
- Neurological signs of envenomation such as ptosis, external ophthalmoplegia, etc

Methodology:

After obtaining approval by the ethical committee and informed consent, all children <12 yrs who were admitted with snake bite were enrolled in the study. A total of 145 cases who met the above criteria were enrolled in the study. The patient's age, sex, site of bite, duration of arrival to the hospital were noted down. The clinical manifestations of the patients were noted down and a detailed clinical examination was done. The investigations relevant were noted down. The number of vials of Antisnake venom given, their complications and their management were taken into account. The complications that occurred due to snake bite were noted down. All the children were followed till discharge or death. The outcome was recorded as alive or dead.

Statistical Tools

The information collected regarding all the selected cases were recorded in a Master Chart. Data analysis was done with the help of computer using Epidemiological Information Package (EPI 2002) developed by Center for Disease Control and Prevention (CDC), Atlanta for W.H.O.

Using this software, frequencies, percentages, means, standard deviations, chi

square and 'p' values were calculated. Kruskal Wallis chi-square test was used to test the significance of difference between quantitative variables and Yate's test for qualitative variables. A 'p' value of less than 0.05 is taken to denote significant relationship.

RESULTS

A: Characteristics of cases studies

Table 1: Age

Age in years	Cases	
	No	%
Up to 4 years	17	11.7
5 – 8 years	49	33.8
9 – 12 years	79	54.5
Total	145	100

The number of cases seen is 17(11.7%) upto the age of 4 yrs, 49(33.8%) from 4-8 yrs and 79(54.4%) from 9-12 yrs. Most of the cases are between the age group of 9-12 yrs.

Table 2: Sex

Sex	Cases	
	No	%
Male	99	68.3
Female	46	31.7

99(68.3%) cases were males and 46(31.7%) cases were females with males being more common.

Table 3: Months

Seasons		
Jan - Mar	29	20
Apr - Jun	26	17.9
Jul - Sep	60	41.4
Oct - Dec	30	20.7

Most of the bites have occurred between July and September with a total of 60(41.4%) cases.

Table 4: Duration between time of snake bite and arrival at Hospital

Time interval in hours	Cases	
	No	%
Less than 4 hours	89	61.4
4 – 8 hours	24	16.6
8 – 12 hours	9	6.2
More than 12 hours	23	15.9
Total	145	100

89(61.4%) cases arrived within 4 hrs of bite, 24(16.6%) between 4-8 hrs, 9(6.2%) cases between 8-12 hrs and 23(15.9%) cases arrived after 12 hrs since bite.

Table 5: Site of bite

Site of bite	Cases	
	No	%
Upper limb	33	22.8
Lower limb	110	75.8
Others	2	1.4

33(22.8%) cases had bite in upper limbs, 110(75.8%) cases had bite in lower limbs and 2(1.4%) had bite in other areas.

Table 6: Treatment given outside

Treatment	Cases	
	No	%
Injection (TT, etc)	24	16.6
I & D	4	2.8
ASV	26	18.1
I & D + ASV	1	0.7

Injections were given 24(16.6%) cases, Incision and Drainage was done for 4(2.8%) cases, Antisnake venom was given for 26(18.1%) cases and both Incision and Drainage and Antisnake venom was given for 1(0.7%) case.

Table 7: Cellulitis

	Cases	
	No	%
Cellulitis		
Yes	89	61.4
No	56	38.6

Cellulitis was present in 89(61.4%) cases and absent in 56(38.6%) cases.

Table 8: Type of toxicity

	Cases	
	No	%
Type of toxicity		
Hemotoxic	77	53.1
Neurotoxic	8	5.5
Only cellulitis	18	12.4
No signs of envenomation	42	29

Out of the 103 poisonous bites hemotoxicity was seen in 77(53.1%) cases, neurotoxicity in 8(5.5%) cases and in 18(12.4%) cases only cellulitis was seen.

Table 9: No of vials of ASV given initially

	Cases	
	No	%
No of vials of ASV		
Up to 10 Vials	64	44.14
More than 10 Vials	33	22.8
Not given	42	29

Out of all the poisonous bites 64(44.14%) cases received Antisnake venom upto 10 vials and 33(22.8%) cases received more than 10 vials initially.

Table 10: Number of vials of ASV given initially and requirement of further ASV

Number of ASV	Requirement of further ASV			
	Required (25)		Not required (72)	
	No	%	No	%
Upto 10 vials (64)	18	28.1	46	71.9
More than 10 vials (33)	7	21.2	26	78.8
‘p’ value	0.4068 Not significant			

Table 11: Anaphylaxis to Antisnake venom

Anaphylaxis to ASV	Cases	
	No	%
Milder reactions (rash, itching, nausea, vomiting, etc)	23	22.3
Severe reactions (shock, bronchospasm, bradycardia, etc)	7	6.8
No reactions	67	70.9

Anaphylaxis in the form of milder reactions were seen in 23(22.3%) cases and severe reactions were seen in 7(6.8%) cases. 7(70.9%) cases had no reactions.

Table 12: Fang marks

Fang marks	Poisonous		
	+	-	Total
+	63	31	94
-	40	11	51
Total	103	42	145

Out of the 103 poisonous bites 63 had fang marks and 40 did not have fang marks. Out of the 42 non poisonous bites 31 had fang marks and 11 did not have fang marks.

Table 13: Lymphadenopathy

Lymphadenopathy	Poisonous		Total
	+	-	
+	58	-	58
-	45	42	87
Total	103	42	145

Out of the 103 poisonous bites 58 had tender lymphadenopathy and no case of non poisonous bite had lymphadenopathy.

Table 14: Complications

Complications	Poisonous bites (103)	
	No	%
Renal failure	8	7.8
Encephalopathy	1	0.98
Osteomyelitis	1	0.98
Gangrene	1	0.98
DIC	2	1.9
Total Complications	13	12.6

Table 15: Management of complications

Management of complications	cases	
	No	%
Blood component transfusion	11	7.6
Fasciotomy	6	4.1
Dialysis	3	2.1
Ventilator support	7	4.8

Table 16: Duration of Hospital stay

Duration	Cases	
	No	%
Up to 5 days	109	75.2
More than 5 days	36	24.8

The duration of hospital stay was less than 5 days for 109(75.2%) cases and more than 5 days for 36(24.8%) cases.

Table 17: Outcome

Outcome	Cases	
	No	%
Alive	139	95.9
Death	6	4.1

Out of the 145 cases 139(95.9%) were alive and 6(4.1%) cases died.

Association between various parameters & outcome

Table 18: Age and outcome

Age group	Outcome			
	Alive		Dead	
	No	%	No	%
Up to 4 years	16	11.5	1	16.7
5 – 8 yrs	49	35.3	-	-
9 – 12 yrs	74	53.2	5	83.3
Mean	8.19 yrs		9.0 yrs	
S.D.	2.93 yrs		2.68 yrs	
'p'	0.5290			
	Not significant			

Table 19: Sex and Outcome

Sex	Outcome			
	Alive		Dead	
	No	%	No	%
Males (99)	94	94.9	5	5.1
Females (46)	45	97.8	1	2.2
'p'	0.3794			
	Not significant			

Table 20: Duration between bite and arrival and outcome

Duration between bite and arrival	Outcome			
	Alive		Dead	
	No	%	No	%
Less than 4 hours (89)	85	95.5	4	4.5
4 – 8 hrs (24)	24	100	-	-
8 – 12 hrs (9)	9	100	-	-
More than 12 hours (23)	21	91.3	2	8.7
Mean	5.63 hours		7.33 hrs	
S.D	5.72 hours		8.26 hrs	
P	0.9093 Not significant			

Table 21: Site of Bite & Outcome

Site of Bite	Outcome			
	Alive		Dead	
	No	%	No	%
Upper Limb (33)	32	97	1	3
Lower Limb (110)	105	95.5	5	4.5
Others (2)	2	100	-	-
P	0.5788 Not significant			

Table 22: Type of Bite & Outcome

Type of Bite	Outcome			
	Alive		Dead	
	No	%	No	%
Hemotoxic (77)	72	93.8	5	6.5
Neurotoxic (8)	7	87.5	1	12.5
Only cellulitis(18)	18	100	-	-
P	0.4579			
	Not significant			

Table 23: Number of ASV given initially & Outcome

Number of ASV	Outcome			
	Alive		Dead	
	No	%	No	%
Upto 10 vials (64)	61	95.3	3	4.7
More than 10 vials (33)	30	90.9	3	9.1
p	0.33			
	Not significant			

Table 24: Complications & Outcome

Complications	Outcome			
	Alive		Dead	
	No	%	No	%
Renal failure (8)	5	62.5	3	37.5
Encephelopathy(1)	-	-	1	100
Osteomyelitis (1)	1	100	-	-
Gangrene (1)	1	100	-	-
DIC (2)	1	50	1	50
Total Complications (13)	8	61.5	5	38.5
No Complications (90)	90	100	-	-
p	0.0001			
	Significant			

DISCUSSION

A total of 145 cases with snake envenomation were enrolled during the period. Out of the 145 cases 103 were due to poisonous bites and 42 were due to non poisonous bites. The most common type of toxicity is hemotoxic which accounts for 77(53.1%) cases of the total 103 poisonous cases compared to neurotoxic which accounted for 8(5.5%) cases and 18 cases presented only with cellulitis. This in contrast to the studies conducted by Sharma et al⁷ & Bharadwaj et al¹¹ in North India in which they have reported higher number of elapid bites.

The commonest age group in this study is 9-12 yrs which accounted for 79(54.5%) cases of the total 145 cases. 99(68.3%) cases were males and 46(31.7%) of them were females. The bites were more common in the rainy season between the months of July and September. Punde et al¹⁰ showed 68.9% of bites between May and December in their study.

Most of the bites have occurred while the children were playing outside the house. The most common site of bite is in lower limbs which were seen in 110(75.8%) cases. The bites which occurred during the sleep were more commonly seen over face and upper limbs.

The mean duration between the bite and arrival to the hospital is less than 4 hrs in 89(61.4%) cases, 4-8 hrs in 24(16.6%) cases, and 8-12 hrs in 9 (6.2%) cases and more than 12 hrs in 23 (15.9%) cases. The cases which arrived late are mostly referred from

other peripheral centers where they have received treatment for a short while.

Out of the referred cases 24(16.6%) of them were given only injections, Incision & drainage was done for 4(2.8%) cases and 26(18.1%) cases have received Antisnake venom. The Antisnake venom that was given in the peripheral centers was less than 10 vials in the 20 cases.

Out of the 103 poisonous bites, 89(61.4%) of them had cellulitis. Fang marks were present in 94(64.8%) cases. But the decision on envenomation depending upon the fang marks is not reliable, because fang marks may or may not be present in poisonous bites and non poisonous bites can also have fang marks. Tender lymphadenopathy was present in 58(40%) cases and is a good indicator of envenomation because all the cases which had tender lymphadenopathy had signs of envenomation.

Antisnake venom was given for 97 cases out of the 103 poisonous bites. 6 cases were not given Antisnake venom because they had already received 10 vials of Antisnake venom from the referring hospital and there were no signs of toxicity at the time of presentation to our hospital. Out of this the initial dose given was less than or equal to 10 vials in 64(44.1%) cases and more than 10 vials in 33(22.8%) cases. More Antisnake venom was required for 18(28.1%) cases which initially received less than or equal to 10 vial of ASV. All the neurotoxic bites were managed with Antisnake venom, injection Neostigmine & atropine and ventilator support was given for those developed respiratory failure.

Anaphylaxis to ASV was seen in 30 cases. Out of the 30, milder reactions like rash, nausea, vomiting, fever, chills and itching were seen in 23(22.3%) cases and severe reactions like shock, bronchospasm and bradycardia were seen in 7(6.8%) cases. No reactions were seen in 67(70.9%) cases. The reactions were managed effectively with intramuscular adrenaline followed by steroids and antihistaminics.

Complications were seen in 13(12.6%) cases out of the 103 poisonous cases. The most common complication in our study was renal failure which occurred in 8(7.8%) cases. This is similar to the study done by adhisivam et al⁶ in JIPMER and Suchitra et al in Kottayam⁸ in which he showed that 18% of the cases had acute renal failure. Disseminated intravascular coagulation was seen in 2 (1.9%) cases, encephalopathy in 1(0.98%) case, osteomyelitis in 1(0.98%) case and gangrene in 1(0.98%) case. Complications were managed with blood component transfusion (11), fasciotomy (6), dialysis (3) and ventilator support (7). Out of the total 145 cases 6 cases died with a mortality rate of 4.1%. The most common cause of death is acute renal failure. The mean duration of hospital stay is less than 5 days in 109(75.2%) cases and more than 5 days in 36(24.8%) cases.

Out of the 8 neurotoxic cases, 1(12.5%) case died and out of the 77 hemotoxic bites 5(6.5%) cases died with a total mortality rate of 4.1%. So we can see from the data that neurotoxic bites carry a high mortality compared to hemotoxic bites. The cases which arrived late (>12 hrs) had a higher percentage of mortality. There were 4(4.5%)

deaths in cases which arrived within 4 hrs and 2(8.7%) deaths in cases which arrived after 12 hrs of bite. There were 3 deaths each in the patients who received initially upto 10 vials and more than 10 vials.

The outcome of the cases mainly depends upon the complications. There is a statistical significance stating that increase in complications leads to increased mortality. The mortality was high in cases which had renal failure, encephalopathy and disseminated intravascular coagulation.

CONCLUSION

Snake bites are still a common problem in the rural areas of the country. As we can see from the study, hemotoxic snakes are the most common cause of bites. Even though neurotoxic bites are less common, mortality is more in them. The complications and mortality is high in cases which arrived late. So early referral and early administration of ASV is life saving. If complications develop adequate management with dialysis, fasciotomy and ventilator support reduces morbidity and mortality. In this study all the complications of Antisnake venom were managed with adrenaline and supportive measures and there is no mortality due to anaphylactic reactions of ASV. So ASV can be safely administered in peripheral health centers and complications can be managed. So ready availability and appropriate use of antisnake venom helps in reducing the mortality. Most of the cases of snake bite can be managed in small rural hospitals with limited facilities.

LIMITATION OF THE STUDY

- As the number of cases is low, statistical significance among various parameters could not be established.

RECOMMENDATIONS

- Educate the rural people regarding the hazards of the snake bite, first aid measures and early referral to hospital.
- Antisnake venom should be readily available in peripheral health centers in adequate amounts and most of the cases can be treated in peripheral centers successfully.
- If complications develop, early referral to tertiary hospital reduces the mortality.

SUMMARY

Objective: To study the clinical profile of snake bite in children.

Methods: It is a prospective observational study conducted in Government Rajaji Hospital, Madurai. **Results:** A total of 145 cases were studied during the period. Hemotoxic snakes (77) accounted for the most number of bites. The cases which arrived late after the bite suffered more complications and mortality. The most common complication in this study is acute renal failure. The mortality rate is 4.1%. The patients who had complications had a high mortality rate. So early recognition, treatment of envenomation and referral to higher center if complications develop helps in reducing the mortality.

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PROFORMA

CLINICAL PROFILE OF SNAKE BITE IN CHILDREN IN GOVT. RAJAJI HOSPITAL

S.NO:

NAME:

AGE:

SEX:

ADDRESS: RURAL/URBAN

SYMPTOMS:

TIME OF BITE:

TIME OF ARRIVAL TO HOSPITAL:

SITE OF BITE:

LOCATION OF BITE:

TYPE OF SNAKE: TOLD/BROUGHT

PAIN:

SWELLING:

BLEEDING FROM LOCAL SITE:

BLEEDING FROM GUMS:

VOMITING:

HEADACHE:

INCREASED SALIVATION:

SWEATING:

PTOSIS:

OLIGURIA:

HEMATURIA:

RESPIRATORY DISTRESS:

H/O OF FIRST AID: TUNICAE/ I&D/ INJECTIONS

ON EXAMINATION:

PR	RR	BP	CRT	TEMP

CONSCIOUS:

BLEEDING FROM GUMS:

PTOSIS:

RESPIRATORY DISTRESS:

LOCAL EXAMINATION:

FANG MARKS:

SWELLING:

TENDERNESS:

ECHYMOSIS:

BLEEDING:

NECROSIS:

LYMPHADENOPATHY:

CARDIOVASCULAR SYSTEM:

RESPIRATORY SYSTEM:

CENTRAL NERVOUS SYSTEM:

ABDOMEN EXAMINATION:

INVESTIGATIONS:

BLEEDING TIME:

CLOTTING TIME:

COMPLETE BLOOD COUNT:

BLOOD UREA & CREATININE:

TREATMENT:

GRADING OF ENVENOMATION:

TIME OF START OF ANTIVENOM:

TIME OF COMPLETION OF ANTIVENOM:

NO OF VIALS OF ANTIVENOM USED:

COMPLICATIONS OF ANTIVENOM:

ANTIBIOTICS:

BLOOD TRANSFUSION:

COURSE IN HOSPITAL:

PROGRESSION OF CELLULITIS:

RENAL PARAMETERS:

ANY FURTHER ASV GIVEN:

DIALYSIS:

FASCIOTOMY:

RESPIRATORY SUPPORT:

DURATION OF HOSPITAL STAY:

OUTCOME

MASTER CHART

s.no	age	sex	duration of arrival	site of bite	cellulitis	Poisonous	type of bite	treatment h/o	fang marks	Lymphadenopathy	no of vials of ASV	further ASV	Anaphylaxis to ASV	blood component transfusion	fasciotomy	outcome
1	10 yrs	F	a	b	+	+	a	a	+	+	a	+	+	+	-	-
2	12 yrs	M	a	b	+	+	a	c	+	+	b	+	-	-	-	-
3	9 yrs	M	d	b	+	+	a	c	+	-	b	-	-	-	-	-
4	10 yrs	M	d	c	+	+	a	c	-	-	-	-	-	-	-	-
5	7 yrs	M	b	b	+	+	a	a	-	-	a	-	+	-	-	-
6	5 yrs	M	a	b	+	+	a	-	+	+	b	-	+	-	-	-
7	9 yrs	M	d	b	+	+	a	c	+	-	b	-	+	-	-	-
8	10 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
9	12 yrs	M	a	b	-	-	-	a	-	-	-	-	-	-	-	-
10	9 yrs	M	b	b	-	-	-	-	+	-	-	-	-	-	-	-
11	10 yrs	F	a	b	+	+	a	a	-	+	b	-	+	-	-	-
12	9 yrs	M	a	a	+	+	a	c	+	+	b	-	-	-	-	-
13	9 yrs	F	a	b	-	-	-	-	+	-	-	-	-	-	-	-
14	11 yrs	F	a	b	-	-	-	-	-	-	-	-	-	-	-	-
15	10 yrs	M	b	b	-	-	-	a	+	-	-	-	-	-	-	-
16	12 yrs	M	a	b	-	-	-	b	-	-	-	-	-	-	-	-
17	12 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
18	10 yrs	F	a	a	-	-	-	-	+	-	-	-	-	-	-	-
19	10 yrs	M	a	b	+	+	a	-	+	+	a	-	-	-	-	-
20	4 yrs	F	b	b	+	+	a	c	+	+	b	-	+	-	-	-
21	7 yrs	M	c	a	-	-	-	-	+	-	-	-	-	-	-	-
22	10 yrs	F	a	b	+	+	a	-	+	+	b	+	+	-	+	-
23	5 yrs	M	c	b	-	-	-	-	+	-	-	-	-	-	-	-
24	9 yrs	F	a	b	+	+	a	-	-	+	b	-	-	-	-	-
25	9 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
26	8 yrs	F	a	b	+	+	b	a	+	+	b	-	+	-	+	-

27	5 yrs	F	a	b	+	+	a	-	-	+	b	+	-	-	+	-
28	12 yrs	M	a	b	+	+	a	-	+	+	b	+	-	-	-	-
29	11 yrs	M	b	b	+	+	a	-	-	+	b	-	-	-	-	-
30	10 yrs	F	d	b	-	+	a	c	-	+	a	-	-	+	-	-
31	10 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
32	11 yrs	M	d	b	+	+	a	c	+	+	b	-	-	-	-	+
33	8 yrs	M	a	b	+	+	-	-	+	-	b	-	-	-	-	-
34	7 yrs	M	c	b	+	+	a	c	+	+	b	-	-	-	+	-
35	5 yrs	M	d	b	-	-	-	-	+	-	-	-	-	-	-	-
36	11 yrs	M	a	b	+	+	a	a	+	+	b	-	-	-	-	-
37	11 yrs	M	a	b	+	+	a	-	+	+	b	-	-	-	-	-
38	2 yrs	M	a	a	-	-	-	-	-	-	-	-	-	-	-	-
39	2 yrs	M	a	b	+	+	a	a	+	+	b	-	-	-	-	-
40	7 yrs	F	a	b	+	+	a	-	+	-	b	-	+	-	-	-
41	6 yrs	M	d	b	+	+	a	-	+	+	b	-	+	-	-	-
42	7 yrs	F	a	b	-	-	-	-	+	-	-	-	-	-	-	-
43	1 yr	M	a	a	+	+	-	-	+	-	b	-	+	-	-	-
44	7 yrs	F	a	b	+	+	a	c	+	+	b	+	+	-	-	-
45	9 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
46	8 yrs	F	b	a	+	+	b	c	+	-	a	-	-	-	-	-
47	11 yrs	M	b	b	-	+	b	c	+	-	b	-	-	-	-	-
48	6 yrs	F	a	b	+	+	a	-	+	+	b	+	+	-	-	-
49	11 yrs	M	a	b	+	+	-	-	-	+	b	-	-	-	-	-
50	5 yrs	F	a	b	+	+	a	-	+	+	b	-	+	-	-	-
51	10 yrs	F	b	b	-	+	a	c	+	-	-	-	-	-	-	-
52	2 yrs	M	a	b	+	+	a	-	+	-	b	-	-	-	-	-
53	10 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
54	12 yrs	M	a	b	-	-	-	a	+	-	-	-	-	-	-	-
55	4 yrs	M	d	b	+	+	a	a	+	+	a	-	+	-	-	-
56	9 yrs	M	c	b	-	+	a	c	-	-	-	-	-	-	-	-
57	5 yrs	F	a	b	-	-	-	-	+	-	-	-	-	-	-	-
58	8 yrs	M	a	a	-	-	-	-	-	-	-	-	-	-	-	-
59	6 yrs	F	a	b	-	-	-	-	+	-	-	-	-	-	-	-
60	7 yrs	M	c	b	-	-	-	-	-	-	-	-	-	-	-	-
61	11 yrs	M	d	a	-	-	-	a	-	-	-	-	-	-	-	-
62	8 yrs	F	d	b	+	+	a	b & c	+	-	a	-	-	-	+	-
63	9 yrs	F	a	b	-	-	-	-	+	-	-	-	-	-	-	-

64	1 yrs	F	d	b	-	-	-	-	-	-	-	-	-	-	-	-
65	11 yrs	M	a	b	+	+	a	-	+	+	a	-	-	-	-	-
66	8 yrs	M	a	b	+	+	a	-	+	+	a	-	+	-	-	-
67	9 yrs	F	a	b	-	+	a	-	+	+	a	-	-	-	-	-
68	3 yrs	M	b	b	+	+	a	-	-	+	a	-	-	-	-	-
69	11 yrs	M	a	b	+	+	a	-	-	+	a	+	-	-	-	-
70	12 yrs	M	b	b	+	+	-		+	+	a	-	+	-	-	-
71	9 yrs	F	a	b	+	+	a	-	-	+	a	-	-	-	-	-
72	11 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
73	5 yrs	F	a	b	+	+	a	b	-	+	a	+	+	-	-	-
74	6 yrs	F	a	a	-	-	-	-	+	-	-	-	-	-	-	-
75	6 yrs	M	a	a	+	+	b	a	+	-	a	a	-	+	+	-
76	8 yrs	M	a	b	+	+	-	-	-	-	a	a	-	-	-	-
77	12 yrs	M	d	b	+	+	a	c	-	+	a	-	-	-	-	-
78	8 yrs	M	d	a	+	+	a	c	-	-	-	-	-	+	-	+
79	9 yrs	M	a	b	-	-	-	-	-	-	-	-	-	-	-	-
80	8 yrs	M	b	b	+	+	-	c	-	-	a	-	+	-	-	-
81	8 yrs	M	b	b	+	+	a	c	+	-	a	-	-	-	-	-
82	8 yrs	F	b	b	+	+	a	c	-	-	a	-	-	-	-	-
83	7 yrs	M	a	b	-	-	-	-	+	-	-	-	-	-	-	-
84	4 yrs	M	c	b	+	+	a	c	+	+	-	-	-	-	-	-
85	4 yrs	M	a	b	-	-	-	a	-	-	-	-	-		-	-
86	8 yrs	F	a	b	+	+	b	-	+	-	a	-	-	-	-	-
87	11 yrs	M	a	b	+	+	a	a	-	+	a	+	-	-	-	-
88	5 yrs	M	a	b	-	-	-	-	+	-	-	-	-	-	-	-
89	10 yrs	F	d	b	-	+	a	b	-	-	a	-	-	-	-	-
90	10 yrs	M	a	b	-	+	a	-	-	-	a	-	+	-	-	-
91	11 yrs	M	a	a	+	+	-	-	-	-	a	-	-	-	-	-
92	11 yrs	M	a	b	-	+	a	-	+	+	a	-	-	-	-	-
93	11 yrs	M	d	b	+	+	a	-	-	+	a	-	+	+	-	-
94	12 yrs	M	b	a	+	+	a	c	+	-	a	+	+	-	-	-
95	7 yrs	M	b	b	-	+	a	c	-	-	a	+	+	-	-	-
96	9 yrs	M	a	b	+	+	a	-	+	-	b	-	+	+	-	+
97	5 yrs	M	a	b	+	+	b	c	-	+	a	-	-	-	-	-
98	9 yrs	M	a	b	+	+	a	a	+	+	a	-	-	-	-	-
99	yrs	M	d	a	+	+	a	a	-	-	a	-	-	+	-	-
100	10 yrs	M	a	a	+	+	a	-	-	+	a	-	+	-	-	-

101	1 yr	M	a	b	+	+	a	-	+	+	a	a	-	-	-	-
102	12 yrs	F	a	b	+	+	-	a	-	-	a	-	+	-	-	-
103	9 yrs	F	a	b	-	-	-	-	+	-	-	-	-	-	-	-
104	8 yrs	F	a	b	-	+	a	a	+	+	a	-	-	-	-	-
105	10 yrs	M	a	b	+	+	a	-	-	-	a	-	+	-	-	-
106	7 yrs	F	c	b	-	-	-	-	-	-	-	-	-	-	-	-
107	3 yrs	M	a	c	+	+	-	-	-	-	a	-	-	-	-	-
108	12 yrs	F	a	b	+	+	a	-	+	+	a	-	-	-	-	-
109	6 yrs	M	a	a	-	+	a	-	-	-	-	-	-	-	-	-
110	6 yrs	M	a	a	-	-	-	-	+	-	-	-	-	-	-	-
111	3 yrs	M	a	b	-	-	-	-	+	-	-	-	-	-	-	-
112	6 yrs	M	a	b	+	+	-	-	+	-	a	-	-	-	-	-
113	12 yrs	M	b	b	+	+	a	a	+	+	a	-	-	-	-	-
114	12 yrs	M	a	b	+	+	a	-	+	+	a	-	-	-	-	-
115	5 yrs	M	c	a	+	+	-	-	+	-	a	-	-	-	-	-
116	12 yrs	M	b	b	-	-	-	-	-	-	-	-	-	-	-	-
117	12 yrs	F	a	b	+	+	a	-	+	-	b	-	+	-	-	-
118	10 yrs	M	b	b	+	+	-	c	+	-	a	-	-	-	-	-
119	11 yrs	M	d	b	+	+	-	c	-	-	a	-	+	-	-	-
120	5 yrs	F	b	b	-	-	-	b	+	-	-	-	-	-	-	-
121	6 yrs	F	a	a	-	+	a	-	-	-	a	-	-	-	-	-
122	5 yrs	F	a	b	+	+	a	-	-	+	a	-	-	-	-	-
123	4 yrs	M	d	b	-	+	b	-	-	-	a	-	-	-	-	-
124	12 yrs	M	d	a	-	-	-	-	+	-	-	-	-	-	-	-
125	2 yrs	M	a	a	-	+	a	-	+	-	a	+	-	-	-	-
126	11 yrs	F	d	b	+	+	-	a	+	-	a	-	-	-	-	-
127	2 yrs	M	d	a	+	+	-	a	+	-	a	-	-	-	-	-
128	5 yrs	F	a	b	+	+	b	-	+	-	b	-	-	-	-	-
129	9 yrs	F	a	b	+	+	a	-	+	+	a	+	-	-	-	-
130	10 yrs	M	b	b	+	+	a	-	+	+	a	+	-	-	-	-
131	9 yrs	M	c	a	+	+	a	-	+	-	a	+	-	+	-	-
132	9 yrs	M	d	b	+	+	a	-	-	-	a	+	+	-	-	-
133	11 yrs	M	d	b	-	-	-	-	+	-	-	-	-	-	-	-
134	8 yrs	M	a	b	+	+	-	a	+	-	a	-	-	-	-	-
135	11 yrs	M	a	b	-	-	-	-	+	-	-	-	-	-	-	-
136	11 yrs	M	b	b	-	-	-	-	+	-	-	-	-	-	-	-
137	12 yrs	M	b	b	+	+	a	c	+	+	a	+	-	-	-	-

138	11 yrs	F	a	b	+	+	-	-	+	+	a	-	-	-	-	-
139	7 yrs	M	a	b	+	+	a	a	+	+	a	-	-	-	-	-
140	10 yrs	M	a	a	+	+	a	-	+	+	a	+	-	+	-	-
141	9 yrs	M	a	a	+	+	a	-	-	+	b	+	-	+	-	-
142	3 yrs	F	b	b	+	+	-	-	+	+	a	+	-	-	-	-
143	10 yrs	F	a	b	+	+	a	-	+	+	b	-	-	-	-	-
144	9 yrs	F	a	b	+	+	a	-	-	+	a	+	-	+	-	-
145	8 yrs	M	b	a	+	+	a	a	-	+	a	-	-	-	-	-

MASTER CHART

Duration of arrival:

a – <4 hrs, b – 4-8 hrs, c – 8-12 hrs, d – >12 hrs

Site of bite:

a – Upper limb, b – Lower limb

Type of bite:

a – Hemotoxic

b – Neurotoxic

Treatment history:

a – Injections

b – Incision and drainage

c – Antisnake venom

d – Incision and drainage and Antisnake venom

Number of vials of Antisnake venom:

a - <10 vials

b - >10 vials

Duration of hospital stay:

a - <5 days

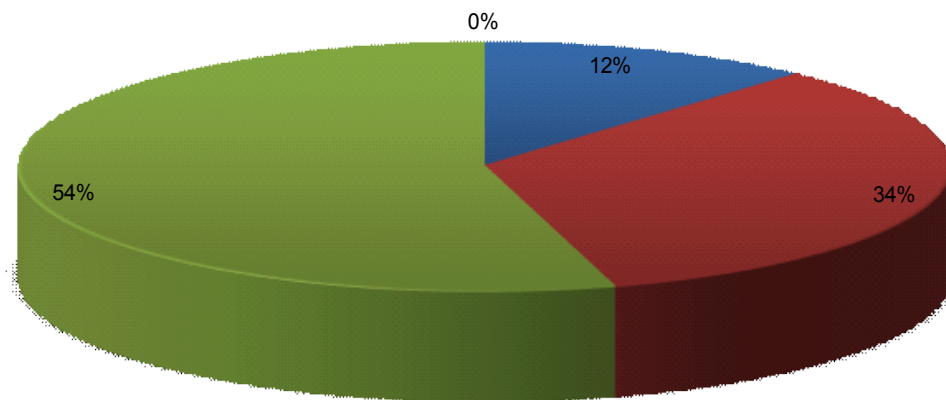
b - >5 days

Outcome:

a – Alive

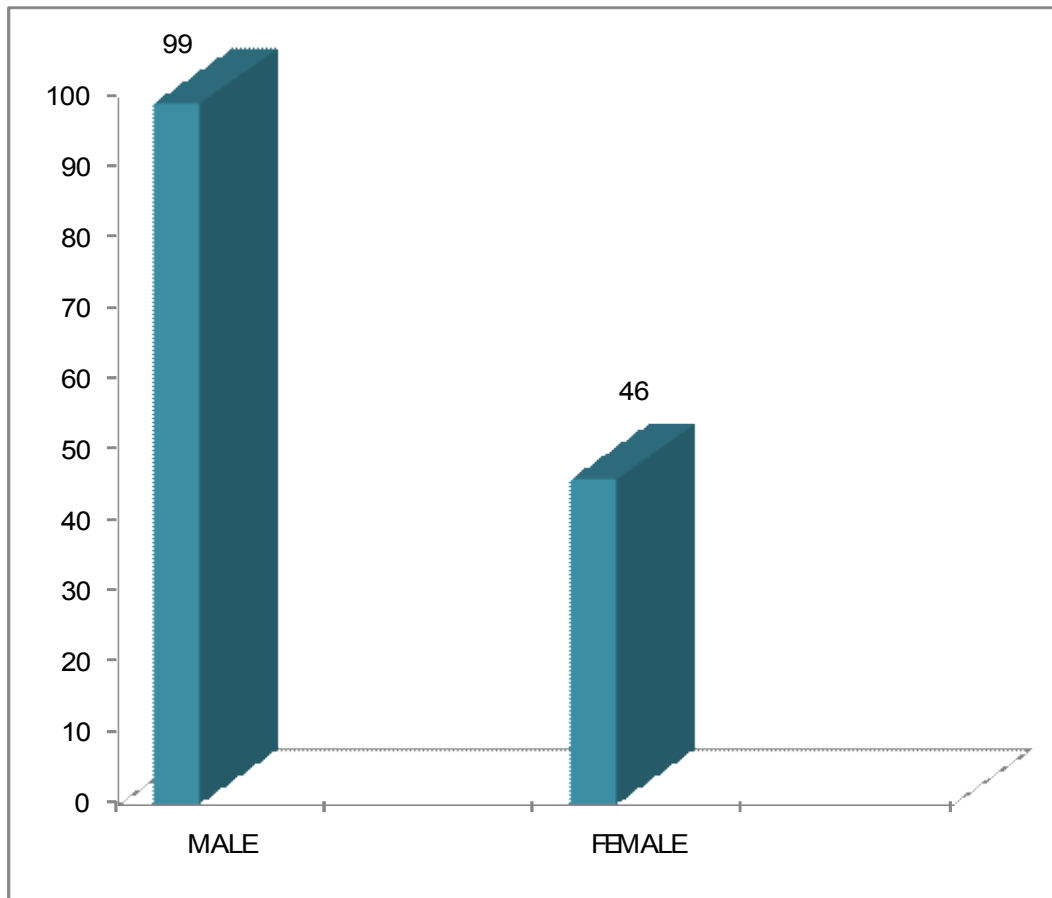
b – Dead

AGE

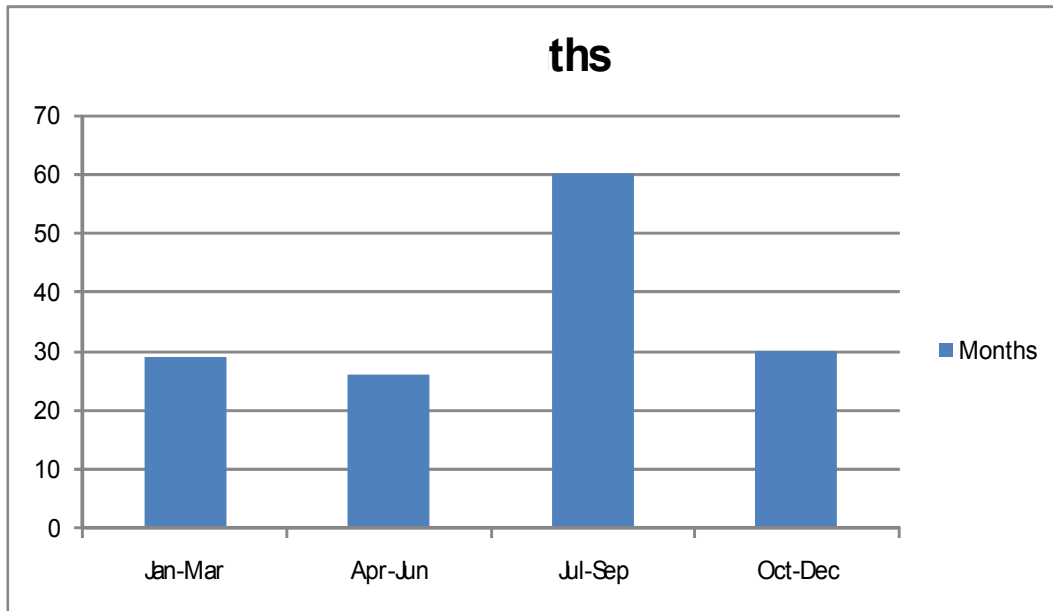


■ Upto 4 years ■ 5 - 8 years ■ 9 - 12 years ■ ■ ■ ■

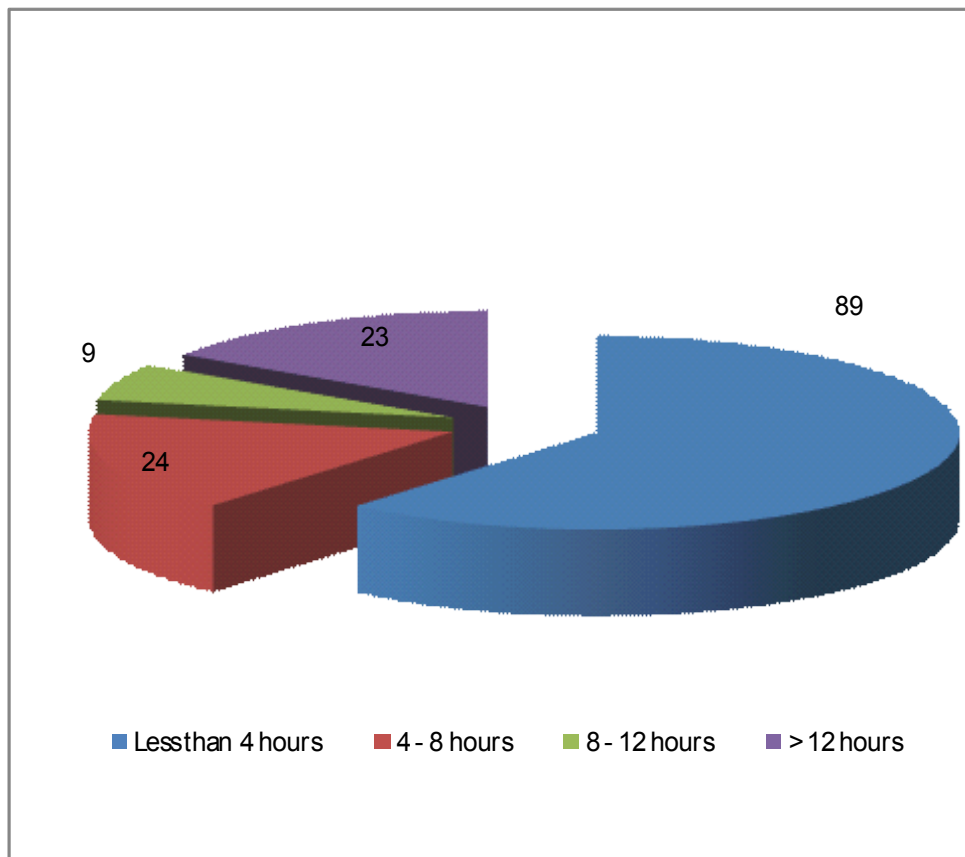
SEX



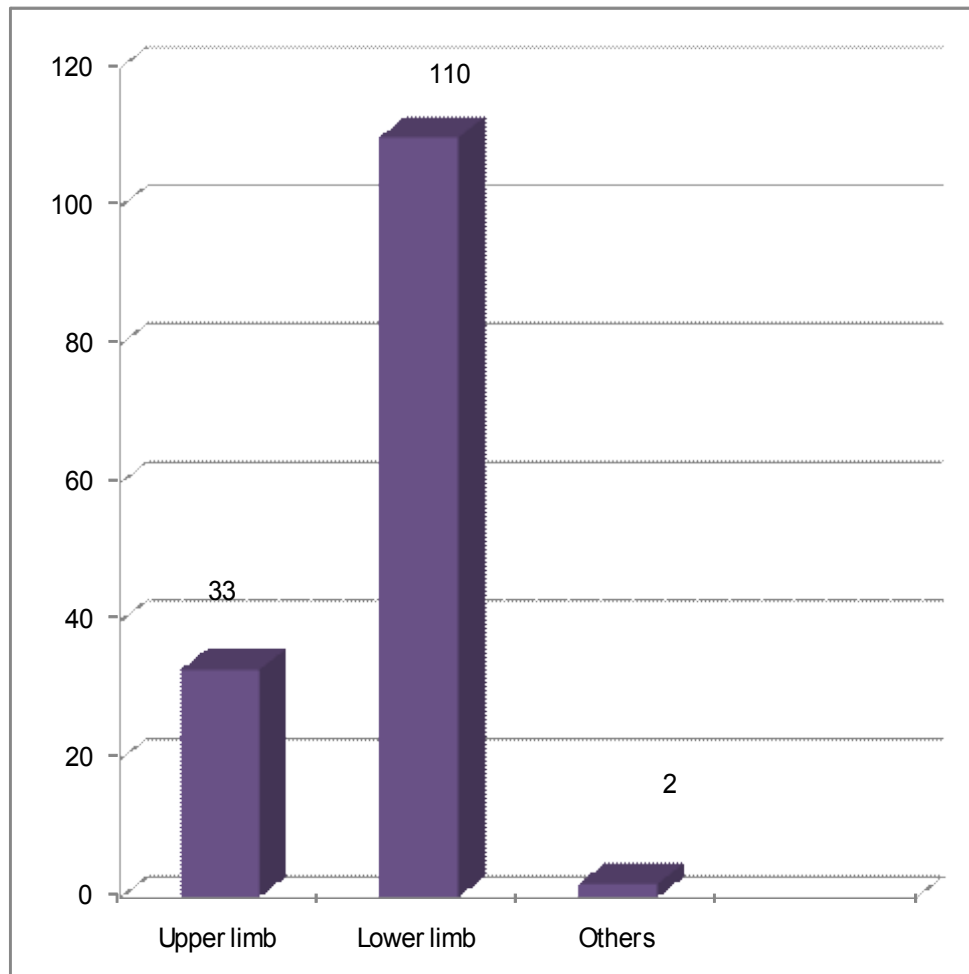
MONTHS



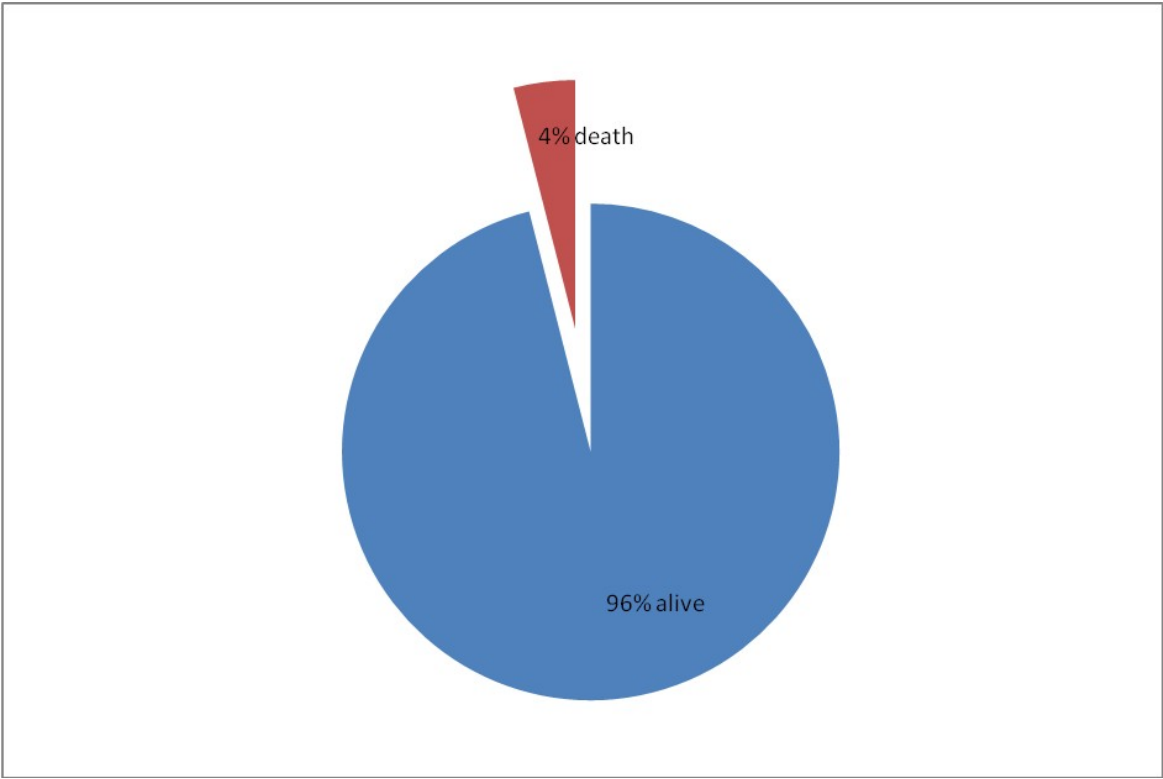
Duration between time of snake bite and arrival at Hospital



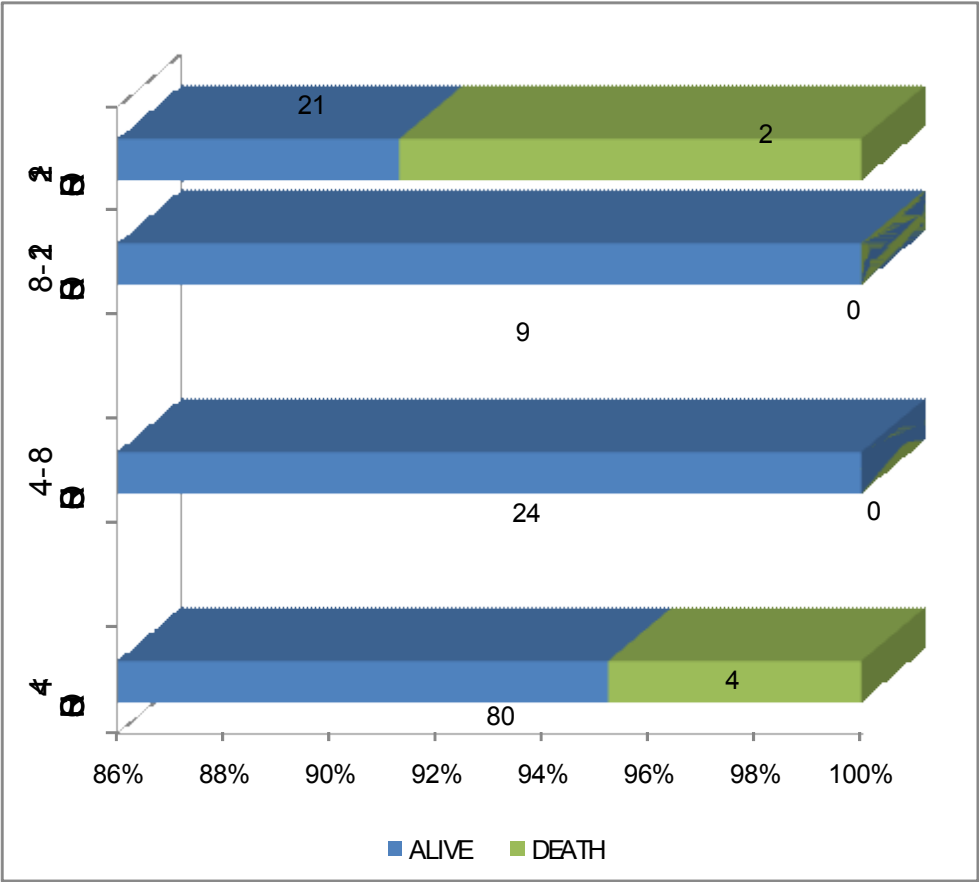
Site of bite



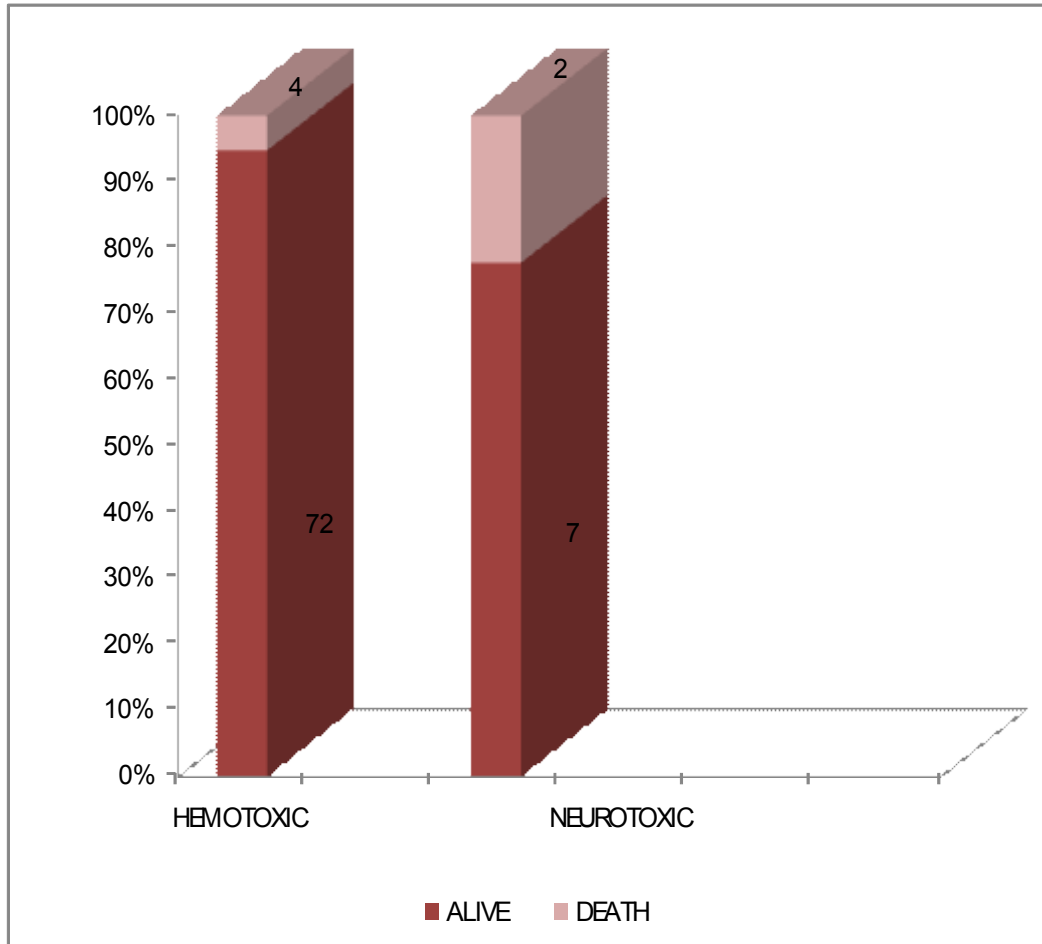
Outcome



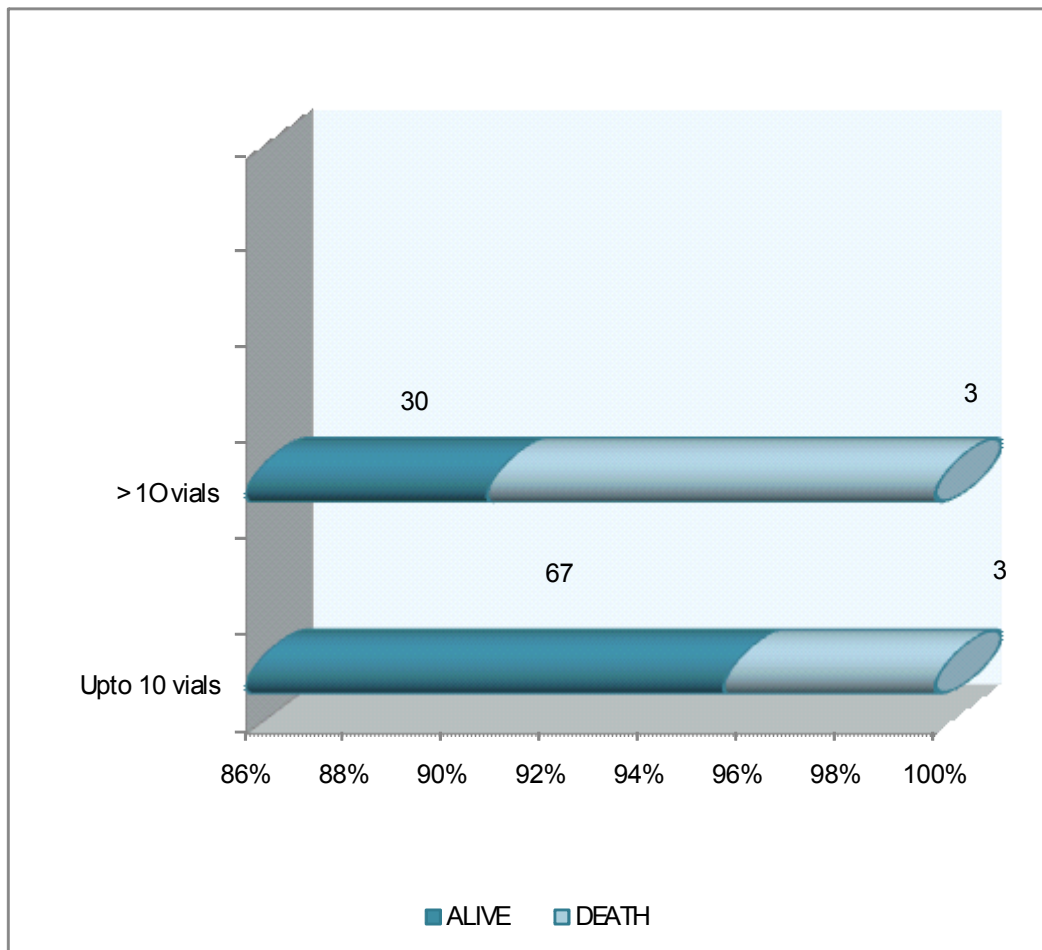
Duration between bite and arrival and outcome



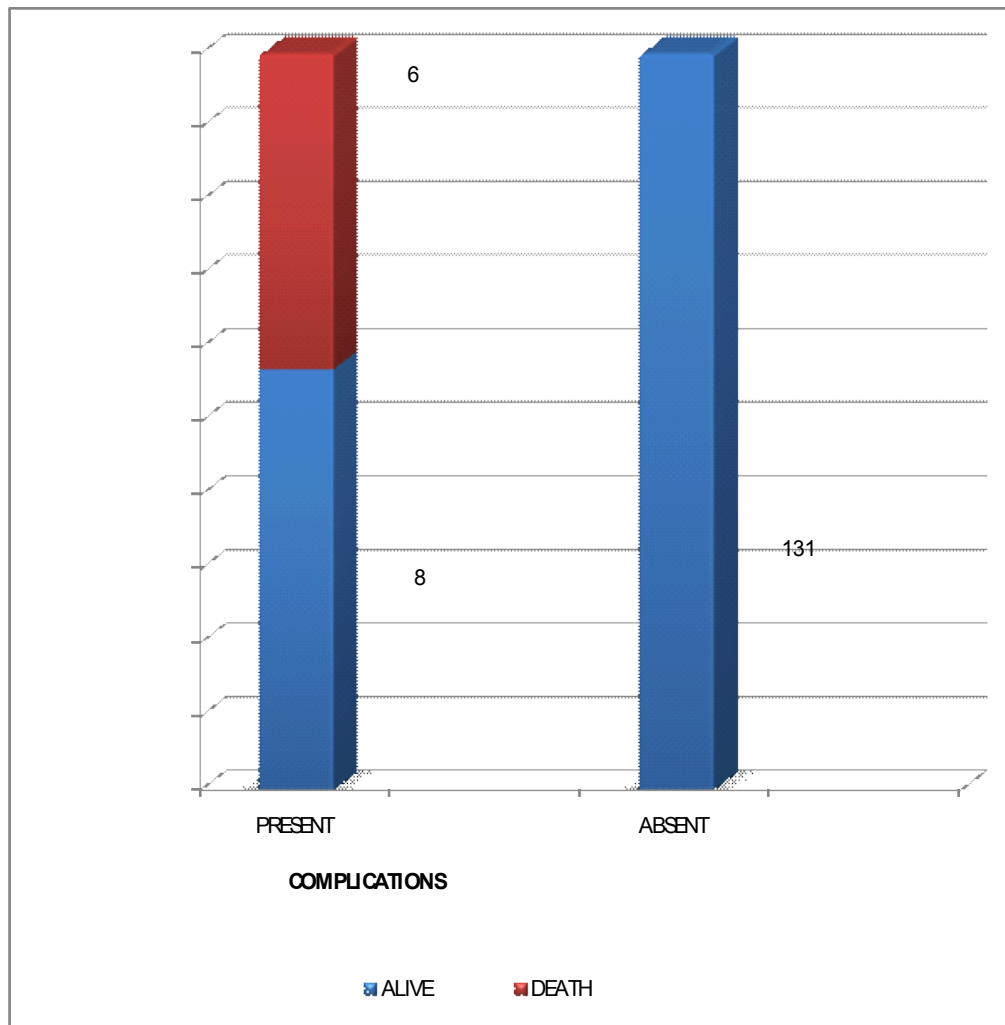
Type of Bite & Outcome



Number of ASV given initially & Outcome



Complications and outcome



A case of hemotoxic snake bite with cellulitis and blebs



A case with bite in the upper limb during sleep with cellulitis



A case of neurotoxic snake bite with respiratory failure



Cobra with hood



A case of snake bite with gangrene and loss of middle finger



A case of hemotoxic snake with renal failure receiving peritoneal dialysis



A case of snake bite with osteomyelitis of lower limb



A case of snake bite with Disseminated intravascular coagulation



Saw scaled viper brought to our casualty measuring 37 and 32 inches

